REMARKS/ARGUMENTS

Previously presented Claims 1-25 are pending in the Application. No claim has been amended.

The Examiner is respectfully requested to enter this request for reconsideration of the final rejections (Office Action dated April 15, 2010 (OA)), withdraw the rejections, and send this Application to issue, for the reasons stated hereafter.

Rejections of Claims 1-10 under 35 U.S.C. § 103 over Fujiwara

Previously presented Claims 1-10 stand finally rejected under 35 U.S.C. § 103 over Fujiwara (U.S. 4,330,331, issued May 18, 1982) (OA, pp, 2-4). For the reasons stated below, the rejections should be withdrawn.

Claim 1 is drawn to a silver alloy consisting essentially of:

97.00 to 99.79 wt% of Ag,

0.10 to 2.89 wt% of Pd,

0.10 to 2.89 wt% of Cu, and

0.5 to 1.50 wt% of Ge.

Claim 2 depends from Claim 1 and closes the claimed silver alloy to metals not recited in Claim 1 but for impurities. Claim 3 sets the ratio of Cu content to Ge content in the claimed silver alloy. Claims 4-9 and 12-14 recite the percent reflectance of light of specified wavelength after exposure to heat, air, humidity, and/or hydrogen sulfide for specified periods of time. Claims 15-18 and 10-25 identify the particular forms the claimed silver alloy may take.

Applicant's Specification teaches that the claimed silver alloys consisting essentially of the elements Ag, Pd, Cu, and Ge in the specific weight percentage range indicated, have

unexpectedly high heat resistance and high resistance to sulfurization [0017]. These unexpectedly superior properties include the capacity to retain high reflectance percentages of light on exposure to heat, air, humidity, and/or hydrogen sulfide for specified periods of time as compared to silver alloys not formed with all the required elements in the specified weight percentages. See the evidence and comparative results reported at pages 14-31 of the Specification [0038-0084], including Table 3 [0084].

Because Applicant's claimed silver alloys "consist essentially" of the four elements identified in the pending claims, they are closed to unspecified elements which materially affect the basic and novel properties of the silver alloys claimed. *In re Herz,* 537 F.2d 549, 551-52 (CCPA 1976); *AK Steel Corp. v. Sollac,* 344 F.3d 1234, 1239 (Fed. Cir. 2003). Moreover, the silver alloys of Applicant's Claim 2 are closed to all elements not specified in the claims but for impurities.

On the other hand, Fujiwara broadly describes an internally oxidized silver alloy comprising (Fujiwara, col. 3, ll. 15-25):

68 to 97 at.% of Ag,

1 to 10 at.% of Au, Pt, Pd, Rh, Ru, Os, and/or Ir;

1 to 5 at.% of Fe, Co, Ni, and/or Cu, and

1 to 17 at.% of Si and/or Ge.

Fujiwara employs its silver alloys to form electrical contact materials high in sticking resistivity, contact resistance, erosion resistivity, and corrosion resistivity. Fujiwara does not appear to be interested in the reflectivity characteristics of the silver alloys disclosed or in maintaining their reflectivity characteristics when exposed to heat and corrosive sulfides.

Significantly, Fujiwara instructs that silver alloys having the required properties may or may not contain an element selected from Fe, Co, Ni, and Cu (Fujiwara, col. 2, 1. 45, to col. 3, 1. 7) and may or may not contain an element selected from Au, Pt, Pd, Rh, Ru, Os,

and/or Ir (Fujiwara, col. 2, 11. 45-50; col. 2, ll. 59-66; and col. 3, ll. 8-14). Moreover, Fujiwara contemplates adding the elements Ti, V, Zr, Nb, Mo, Ta, W, and Re in amounts ranging from 1 to 5 at.% (Fujiwara, col. 2, 1. 59, to col. 3, 1. 7).

In fact, Fujiwara teaches that silver alloys with 1-17% of Si and/or Ge and 1-10% of Au, Pt, Pd, Rh, Ru, Os, and/or Ir without other elements have remarkable corrosion resistivity to, for example, hydrogen sulfide gas (Fujiwara, col. 4, 11. 52-68) and high erosion resistivity (Fujiwara, col. 5, ll. 31-57). Fujiwara also teaches that the addition of Ti, V, Zr, Nb, Mo, Ta, W, and Re to the silver alloy advantageously improves weld resistivity and contact resistance (Fujiwara, col. 5, ll. 1-30). The addition of 1-5% Fe, Co, Ni, and/or Cu to the silver alloy appears to be optional for improving electrical contact erosion resistance (Fujiwara, col. 2, ll. 58-64). Again, Fujiwara is not at all concerned with maintaining the reflectivity of the electrical contacts made from its silver alloy materials or the specific kinds of elements and amounts thereof required to maintain reflectivity.

Fujiwara requires a minimum of 1 at.% of each of the added kinds of elements in the silver alloy in order to provide some beneficial effect (Fujiwara, col. 4, 1. 52, to col. 5, 64). Moreover, Fujiwara instructs that at least 7 to 17 at.% of Si and/or Ge is required to improve erosion resistivity to a reasonably effective level (Fujiwara, col. 5, ll. 31-57; and cols. 7-8, Examples 4-7 and Tables 1 and 2). See especially the data presented in Fujiwara's Table 2 for Ge (Fujiwara, col. 7, Table 2).

Accordingly, even assuming that persons having ordinary skill in the art reasonably would have been led by Fujiwara's disclosure to make and use silver alloys comprising 68 to 97 at.% of Ag; 1 to 10 at.% of any one of the elements Au, Pt, Pd, Rh, Ru, Os, and Ir with expectation of substantially the same results; 1 to 5 at.% of any one of the elements Fe, Co, Ni, and Cu with expectation of substantially the same results; and 1 to 17 at.% of either Si or Ge with expectation of substantially the same results, Fujiwara would not have suggested a

lower limit in the silver alloy of 97 at.% Ag in combination with a required Pd content in the silver alloy of at least 1 at.%, a required Cu content in the silver alloy of at least 1 at.%, and a required Ge content in the silver alloy of at least 1 at.%. Fujiwara demonstrates that silver alloys which are effective as electrical contact materials preferably contain a minimum Si or Ge content of 7 at.%.

Moreover, Fujiwara is not concerned with preparing silver alloys which have high reflectivity and retain the same level of reflectivity on exposure to heat and corrosive sulfides. Fujiwara is only concerned with making and using electrical contact materials which are high in sticking resistivity, contact resistance, erosion resistivity, and corrosion resistivity. Fujiwara teaches away from silver alloys consisting essentially of 97.00 to 99.79 wt% of Ag; 0.10 to 2.89 wt% of Pd; 0.10 to 2.89 wt% of Cu; and 0.5 to 1.50 wt% of Ge. Teaching away from Applicant's claimed composition is a strong indication of unobviousness. *KSR International Co. v. Teleflex Inc.,* 550 U.S. 398, ___ (Slip Opinion, p. 12)(2007).

Additionally, Applicant's Figures 11 and 12 minimally show:

(1) Silver alloys comprising contents of Ag, Pd, and Cu and 1.5 wt.% Ge (Example 14) within the ranges specified therefore in Applicant's Claim 1 unexpectedly show significantly greater reflectance at wavelengths from 400 to 800 nm than silver alloys comprising the same contents of Ag, Pd, and Cu within the ranges specified in Applicant's Claim 1 and 1.6 wt.% Ge (Comparative Example 11), which is outside the range specified for Ge in Applicant's Claim 1, when exposed to a temperature of 85°C and 90% RH for 200 hours [0074]-[0077].

(2) Silver alloys comprising contents of 98.9 wt.% Ag, 0.6 wt.% Pd, 0.3 wt.% Cu, and 0.2 wt.% Ge (Example 15), which are within the broadest

acceptable ranges specified therefore in Applicant's Specification, unexpectedly show significantly greater reflectance at wavelengths from 400 to 800 nm than silver alloys also comprising the same element content within the broadest acceptable ranges specified therefore in Applicant's Specification but for a content of either 3.0 wt.% Pd (Comparative Example 13) or 3.0 wt.% Cu (Comparative Example 12), which is outside the range specified in Applicant's Claim 1, when exposed to a temperature of 85°C and 90% RH for 200 hours [0079]-[0083].

The Examiner also will recognize that Examples 1-15 in Applicant's Table 3 at [0084] are not silver alloys within the scope of Fujiwara's disclosure. Not surprisingly, Comparative Examples 11-13 which show comparatively inferior reflectance relative to Applicant's inventive silver alloys also fall outside the scope of Fujiwara's disclosure. Fujiwara is not at all concerned with reflectance. Fujiwara's invention relates to electrical contact materials only. Fujiwara prefers silver alloys comprising at least 7 at.% of Si or Ge and no more than 93 wt.% Ag. Applicant's Specification teaches that the reflectance of silver alloys comprising no more than 93 wt.% Ag is entirely unacceptable for its purposes. While Fujiwara teaches that silver alloys comprising 97 wt.% Ag or less may be found which are acceptable for use as electrical contact materials, Applicant's Specification teaches that silver alloys comprising less than 97 wt.% Ag have unacceptable reflectance and therefore are not claimed.

If there is an overlap point in the content of the silver alloys described in Fujiwara and encompassed by Applicant's claims at 1% Pd, 1% Ge, and 1% Cu, Fujiwara would have reasonably led persons having ordinary skill in the art away from that overlapping point composition where the goal is to effectively make and use electrical contact material having

acceptable erosion and corrosion resistivity. Moreover, Fujiwara instructs that the silver alloys useful for electrical contact material may or may not include any of the added elements required in the silver alloys Applicant's claims.

Where, as here, the prior art instructs that the elements required in Applicant's claimed silver alloys are not critical for its purposes and that the result effective variables to be optimized in order to make and use silver alloys for its purposes differ significantly from those which are important for accomplishing Applicant's goals and results, the case for obviousness reasonably must fall. Intending to optimize the silver alloy content for Fujiwara's purposes, persons having ordinary skill in the art would not have been led to the low Ge content silver alloy Applicant claims. Accordingly, the rejections fairly should be withdrawn.

<u>Rejections of Claims 1-23 under 35 U.S.C. § 103 over JP '568</u>

Previously presented Claims 1-23 stand finally rejected under 35 U.S.C. § 103 over JP '568 (JP 2002-332568, published November 22, 2002)(OA, pp, 4-5). For the reasons stated below, the rejections should be withdrawn.

Again, Applicant's Claim 1 is drawn to a silver alloy consisting essentially of:

97.00 to 99.79 wt% of Ag,

0.10 to 2.89 wt% of Pd,

0.10 to 2.89 wt% of Cu, and

0.5 to 1.50 wt% of Ge.

Claim 2 depends from Claim 1 and closes the claimed silver alloy to elements not recited in Claim 1 but for impurities. Claim 3 specifies the ratio of the Cu content to the Ge content in the claimed silver alloy. Claims 4-9 and 12-14 recite the percent reflectance of light of specific wavelength after exposure to heat, air, humidity, and/or hydrogen sulfide for

specified periods of time. Claims 15-18 and 10-25 identify the particular forms the claimed silver alloy may take.

Applicant's Specification teaches that the claimed silver alloys consisting essentially of the elements Ag, Pd, Cu, and Ge in the specific weight percentage ranges indicated, have unexpectedly high heat resistance and high resistance to sulfurization [0017]. The claimed silver alloys retain high reflectance percentages of light on exposure to heat, air, humidity, and/or hydrogen sulfide for specified periods of time as compared to silver alloys not formed with all the required elements in the specified weight percentages. See the evidence and comparative results reported at pages 14-31 of the Specification [0038-0084], including Table 3 [0084].

Because Applicant's claimed silver alloys "consist essentially of" the four elements identified in the pending claims, they are closed to unspecified elements which materially affect the basic and novel properties of the silver alloys claimed. *In re Herz, supra; AK Steel Corp. v. Sollac, supra*. Applicant's Claim 2 is closed to all elements not specified in the claims but for impurities.

With the scope of Applicant's claimed silver alloys as a comparison, JP '568 broadly describes a silver alloy sputtering target material which also is said to have high reflectivity and excellent sulfidation resistance (JP '568, Abstract). The sputtering target material appears to comprise (JP '568, Claim 2 and [0011]): Ag and

(A) 0.05-4.8 mass% of Ge, Ga, or Sb;

(B) 0.1 to 4.9 mass% of Pd or Pt; and optionally

(C) 0.05-4.85 mass% of Cu;

wherein the total content of elements (A), (B), and (C) in the silver alloy is 0.2-5 mass%.

We specifically note the teaching in JP '568 that a small amount of Cu may be added to the silver, "if necessary" (JP '568, Abstract). Accordingly, unlike Applicant's claimed

silver alloy, the addition of Cu appears to be optional, i.e. "which add Cu by the case further" [0014]; "the case where Cu is added" [0015]; "Cu added if needed" [0019]. Note that only the silver alloy of Example 5 in the inventive portion of JP '568 Table 1 [0027] includes Cu.

Moreover, Example 5 of JP'568 is the only silver alloy among the inventive silver alloys of JP'568 Table 1 which comprises Ag and three separate additional elements. However, Example 5 comprises Ag, In, Au, and Cu which content not only has no relationship whatsoever to the silver alloy Applicant claims consisting essentially of Ag, Pd, Cu, and Ge, but also has no relationship whatsoever to the inventive silver alloys generally described JP'568. Inventive Example 5 in JP'568 Table 1 does not include a metal component (A) selected from Ge, Ga, and Sb which appears to be required in the inventive silver alloys JP'568 discloses.

On the other hand, Applicant's Figure 7 compares the reflecting spectrums of Applicant's inventive Example 2 including 98.7 wt.% Ag, 0.8 wt.% Pd, 0.3 wt.% Cu, and 0.2 wt.% Ge to Comparative Example 6 including 99.0 wt.% Ag, 0.8 wt.% Pd, and 0.2 wt.% Ge, but excluding Cu. Thus, a silver alloy broadly encompassed by the JP '568 disclosure which includes 0.3 wt.% Cu unexpectedly shows a significantly greater reflectance percentage than does the allegedly equivalent silver alloy without the Cu content. This evidence shows, contrary to the broad teachings in JP '568, that the addition of Cu to Ag/Pd/Ge alloys indeed is critical for achieving and maintaining a high reflectance silver alloy.

Moreover, a silver alloy comprising 98.9 wt.% Ag, 0.6 wt.% Pd, 0.3 wt.% Cu, and 0.2 wt.% Ge (Example 15), which is within the broadest acceptable ranges specified therefore in Applicant's Specification, unexpectedly shows significantly greater reflectance at wavelengths from 400 to 800 nm when exposed to a temperature of 85°C and 90% RH for 200 hours [0079]-[0083] than do comparative silver alloys which have element contents within the broadest acceptable ranges specified therefore in Applicant's Specification except

for a higher content of either 3.0 wt.% Pd (Comparative Example 13) or 3.0 wt.% Cu (Comparative Example 12). The inferior comparative silver alloys of Applicant's Comparative Examples 13 and 12 fall outside the required element content ranges specified in Applicant's Claim 1 but fall well within the scope of the inventive silver alloys taught in JP '568. Accordingly, not only are the elements Pd and Cu important for producing the claimed silver alloys with initial high reflectance, but the specified amounts of Pd and Cu required in Applicant's claims are also significant to achieve initial high reflectance.

Next, persons having ordinary skill in the art would have learned from Applicant's Table 3 and Figure 11 that silver alloys comprising contents of Ag, Pd, and Cu and 1.5 wt.% Ge (Example 14), which are within the ranges specified therefore in Applicant's Claim 1 and the ranges suggested by JP '568, unexpectedly show significantly greater reflectance at wavelengths from 400 to 800 nm when exposed to a temperature of 85°C and 90% RH for 200 hours [0074]-[0077] than silver alloys comprising the same contents of Ag, Pd, and Cu within the ranges specified in Applicant's Claim 1 and 1.6 wt.% Ge (Comparative Example 11), which is outside the range specified for Ge in Applicant's Claim 1 but well within the acceptable range specified therefore in JP '568.

Finally, no example or comparative example reported in Table 1 [0027] of JP '568 describes any silver alloy comprising the elements Ag, Pd, Ge, and Cu. In fact, none of the examples in Table 1 [0027] of JP '568 includes Ag and two additional elements selected from Pd, Ge, and Cu. The Examiner will note that the inventive silver alloy of Example 5 of JP'568 Table 1, the only inventive silver alloy JP'568 exemplifies which includes Ag and three additional elements, includes Ag, In, Au, and Cu but does not include either Pd or Ge. To the contrary, Applicant's Figures 7 and 9 show that the reflectance percentages of Applicant's inventive Example 2 and claimed Example 3 are significantly better than the

reflectance percentages of Comparative Examples 2, 4, and 6, which exclude either Ge, Cu, or both elements, when exposed to the same conditions.

To the extent there is some overlap in the content of the silver alloys generally described in JP '568 and encompassed by Applicant's claims, JP '568 reasonably would have led persons having ordinary skill in the art away from that overlapping content. In fact, JP '568 reasonably would have taught persons having ordinary skill in the art that its disclosed silver alloys will have high reflectance and high resistance to heat and corrosive sulfides regardless of the kinds, numbers, and amounts of the elements of groups (A), (B), and (C) in the silver alloys disclosed by JP '568, i.e., without any significant effect on the properties of its silver alloys. The evidence in Applicant's Specification unexpectedly shows that the overly broad teaching in JP '568 is clearly erroneous and generally incredible. Applicant has shown that all the specific elements and specific amounts thereof required in Applicant's claimed silver alloys are important for achieving high reflectance and heat and corrosion resistance. JP '568 reasonably would not have placed any of the specific, unexpectedly superior silver alloys Applicant claims in the public domain.

Where, as here, the prior art instructs that the kinds and amounts of elements required in Applicant's claimed silver alloys are not critical to make and use silver alloys which have high reflectance and retain high reflectance under extreme conditions, and Applicant's Specification instructs and provides evidence that the specific kinds and amounts of elements required in Applicant's claimed silver alloys are most critical for obtaining high reflectance and retaining high reflectance under extreme conditions, the case for obviousness of the specific silver alloys Applicant claims over the prior art cannot stand. JP '568 does not provide the requisite suggestion, incentive, or motivation to make and use the silver alloys Applicant claims with any reasonable expectation of success. *In re O'Farrell,* 853 F.2d 894,

903 (Fed. Cir. 1988). Accordingly, the final rejections under 35 U.S.C. § 103 in view of the teaching of JP '568 should be withdrawn.

Rejections of Claims 24-25 under 35 U.S.C. § 103 over JP '568 and JP '907/JP '066

Previously presented Claims 24-25 stand finally rejected under 35 U.S.C. § 103 over JP '568 in view of either JP '907 (JP 10-282907, published October 23, 1998) or JP '066 (JP 05-341066, published December 24, 1993). For the reasons stated for withdrawing the rejections of previously presented Claims 1-23 under 35 U.S.C. § 103 over JP '568, the rejections of Claims 24-25 over the combined prior art teachings also should be withdrawn.

Basically, the Examiner argues that silver alloys are recognized in the art as suitable for use as electromagnetic shielding films and used in the form of silver alloy pastes. The recognized utility and form of well-known or obvious silver alloy materials is acknowledged. However, the combined prior art reasonably would not have led persons having ordinary skill in the art to the new silver alloys claimed in the particular form claimed.

For the reasons stated, Applicant's claims are allowable over the applied prior art and in condition for allowance. Thus, early Notice of Allowance is respectfully requested.

Respectfully submitted,

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